



Supporting Science through Common Core Literacy

Employing dialogue, reading and writing to help understand content


**Understanding and Using the Vision from the
Framework for K-12 Science Education to
Improve Science Teaching and Learning**

Dec. 6, 2013

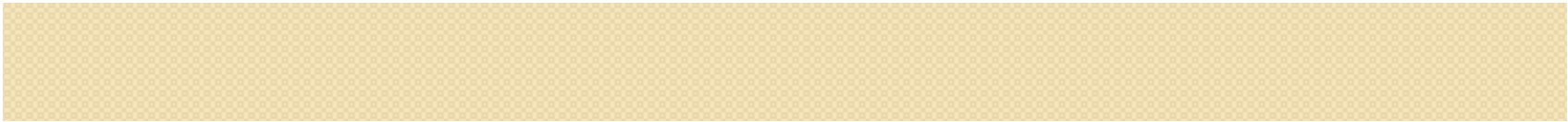
Arthur Beauchamp

Our Journey Today

- **What** – Increase our capacity to support teachers in their transition to Common Core and Framework aligned instructional practices.
- **Why** – Common Core is here, we have been charged with helping students access science and communicate their science understanding. And because we know much more about teaching and learning.
- **How** – By considering some instructional frames, by engaging in content with literacy embedded in it (using literacy to understand science), and reflecting on what Common Core asks teachers of science to do.



Taking Science to School (NRC, 2007) – describes science as a social phenomenon, in which a community of peers pursues shared objectives and abides by shared conventions that shape their work.

- In other words, people (and students) engage in science (or history or math or literary analysis) by sharing ideas, theories, and models; by collecting and analyzing data; by constructing and critiquing arguments; and by using specialized ways of talking and writing.
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Science Literacy Framework

Engaging Science Experience

Interact with data – Hands-on – Phenomena – Inquiry

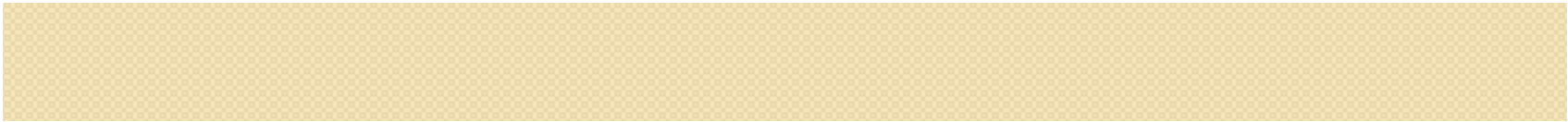
**Purposeful
Reading**

Productive Dialogue

**Meaningful
Writing**



Evaporation and Energy

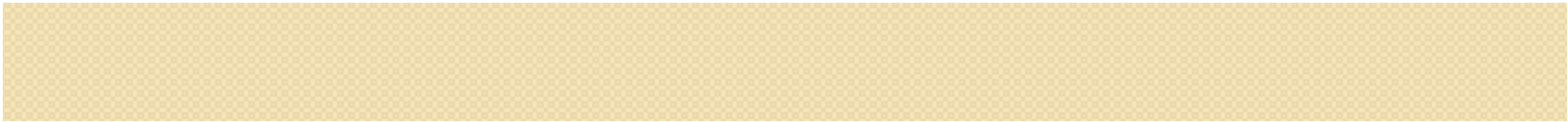
- The lesson and handouts were developed using the Science Literacy Framework[©]. This lesson is intended for teacher learning purposes and while possible for use in the classroom might require modifications based on the teachers' instructional objectives and the level of students being served.
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Evaporation and Energy

- Do the Evaporation and Energy activity
 - Three things to pay attention to:
 - Holding the thermometer
 - Swipe technique
 - Structured Think-Pair-Share



Evaporation and Energy

- On the Data and Observation Sheet –
 - Bottom of page 1 – create your representation.
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Condensation and and Energy


- Make your observations, record and enter the Structured Think-Pair-Share
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Summary Protocol

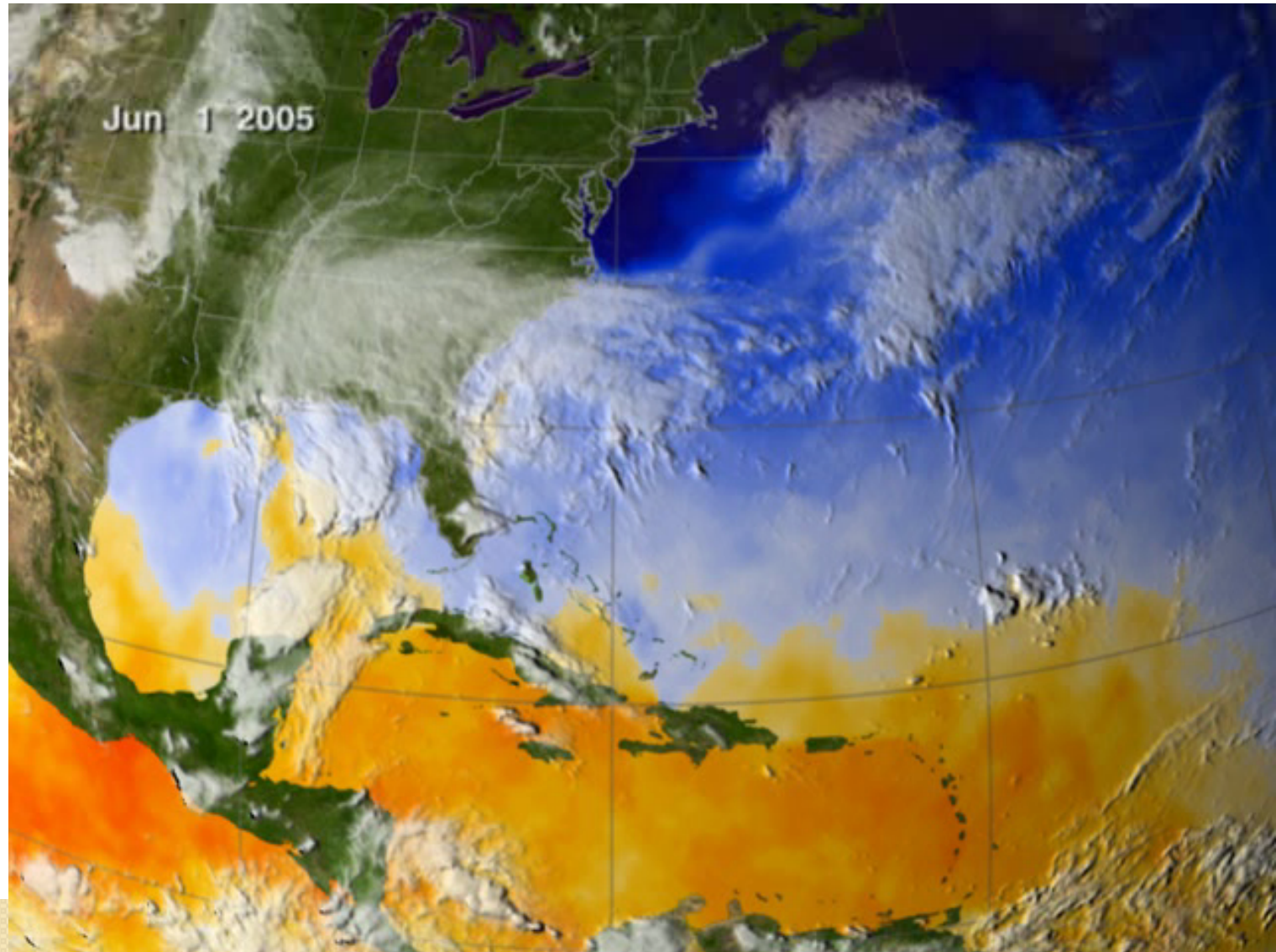
- In groups – one person is chosen to keep the group on-task.
- Read one paragraph silently (leader makes sure all group members know where paragraph starts and ends).
- After everyone in the group is finished reading the paragraph, the group discusses the main idea(s).
- The group comes to consensus about one (or two) main idea(s).
- The group talks about how to write the main idea(s).
- Each group member writes down the main idea(s).
- Repeat steps 2 – 6 for all five paragraphs of the reading.



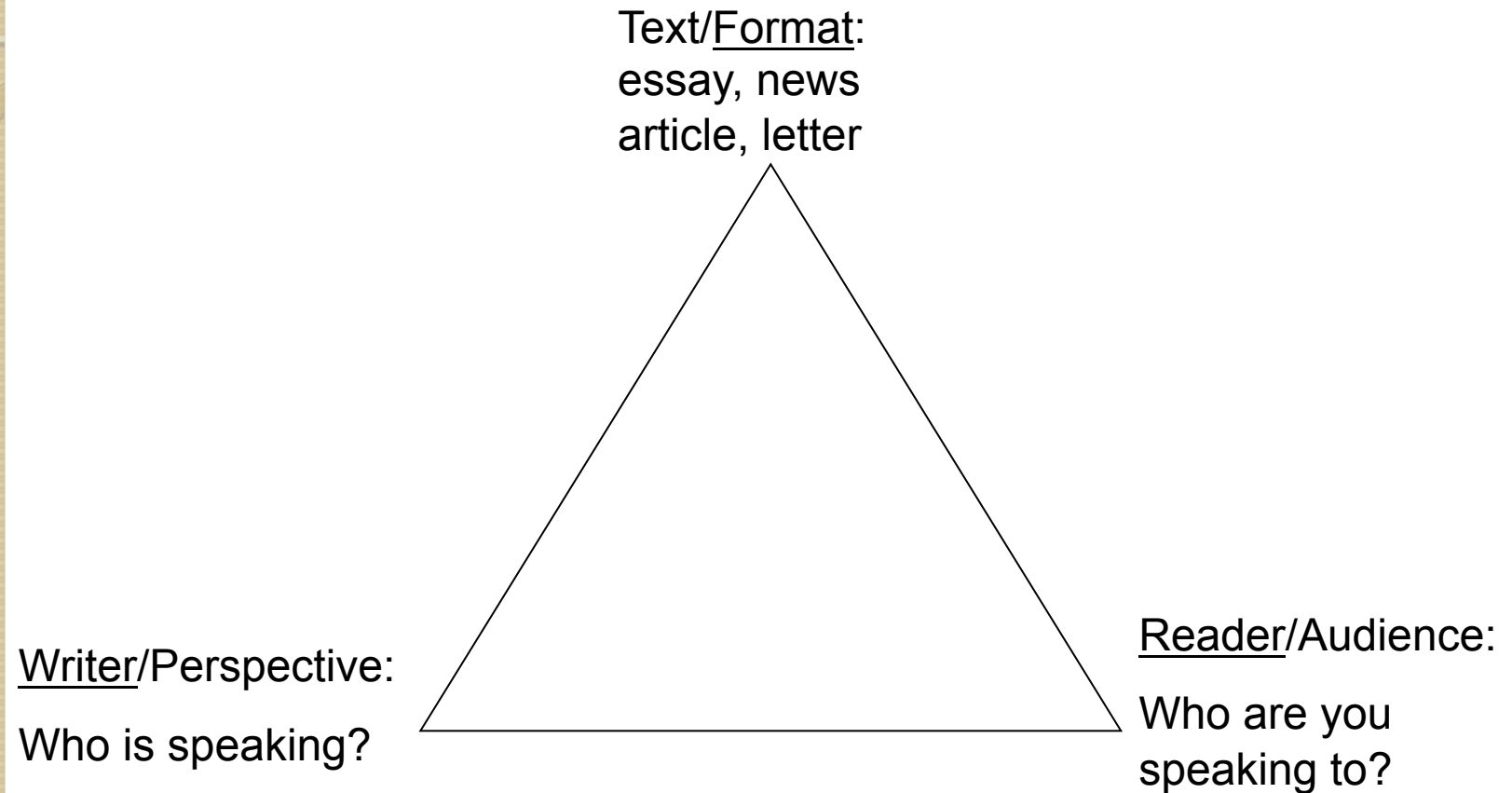
Hurricanes

- What do we understand at this point about evaporation and condensation and the energy relationships associated with each?
 - Complete in the representation sheet.
 - How do you think the sea surface temperature will change when a hurricane passes over? Will the sea surface have a net gain or loss of energy? How does a hurricane transfer energy?
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2005 Named Hurricanes



The Communication Triangle



Potential Writing Task

- You are a meteorologist writing the script for a news report about how evaporation moves energy around as hurricanes develop and travel across the ocean for the local TV station.



Lesson Sequence

1. Phenomenon (activity)
2. Think–Pair–Share (dialogue and writing)
3. Representation (drawing)
4. Phenomenon (activity)
5. Think–Pair–Share (dialogue and writing)
6. Summary Protocol (processing text)
7. Video clip (whole group dialogue)
8. Representations and summarizing thinking
(writing and dialogue)
9. Writing Task

What Did We Hit?



What does Common Core ask for?

Common Core

Speaking and Listening:

- Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on topics and texts, building on others' ideas and expressing their own clearly.

Reading:

- Ask and answer questions to demonstrate understanding of text, referring explicitly to the text as the basis for the answers.
- Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Writing:

- Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.
- Write opinion pieces on topics or texts, supporting a point of view with reasons.
- Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

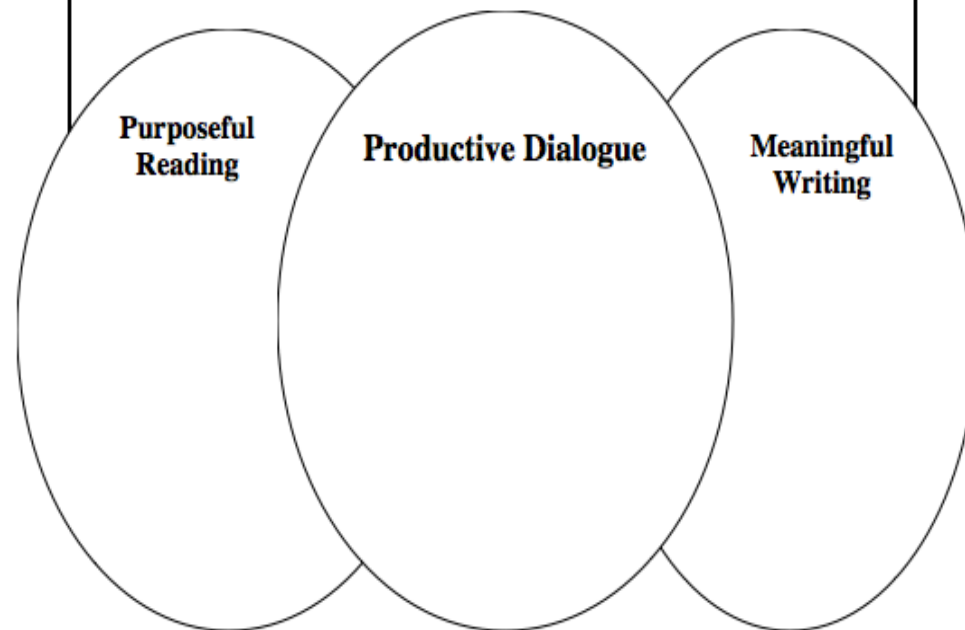
K-12 SCIENCE EDUCATION FRAMEWORK (2011)

SCIENTIFIC AND ENGINEERING PRACTICES

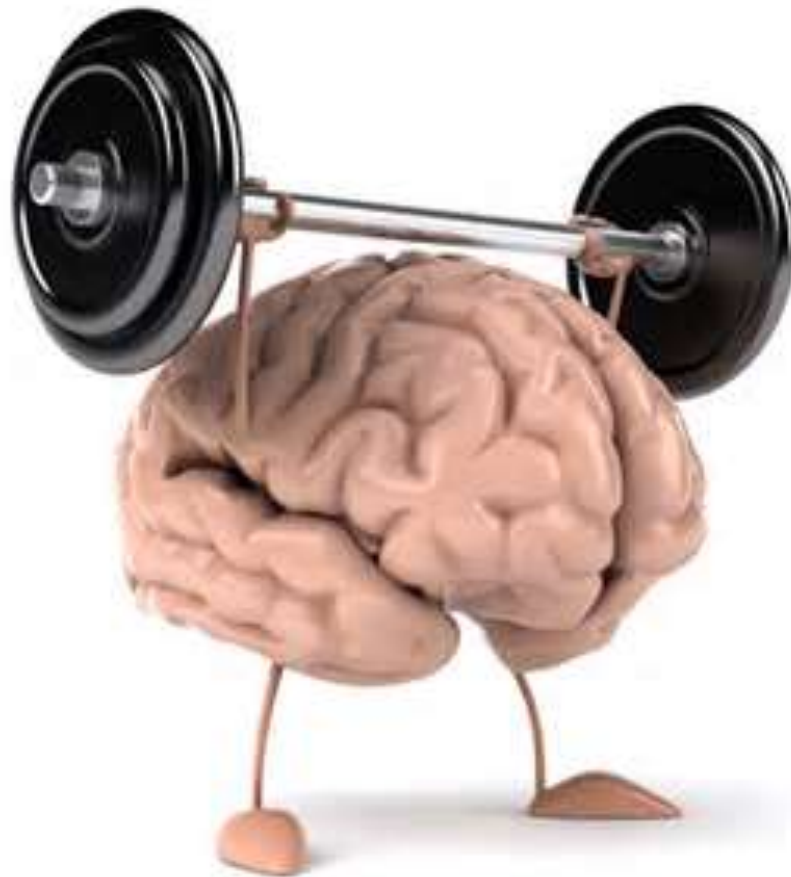
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Science Literacy Framework

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Interact with data – Hands-on – Phenomena – Inquiry



Sacramento Area Science Project



Thank You

- <http://sasp.ucdavis.edu>
- acbeauchamp@ucdavis.edu

Why
science
teachers
are not
asked to
monitor
recess.





SUCCESS IN SCIENCE

through **DIALOGUE,**
READING and **WRITING**

by ARTHUR BEAUCHAMP
JUDI KUSNICK
RICK McALLUM

edited by JIM HOLLANDER